2006
Michigan Severe Weather Awareness

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The Michigan Committee for Severe Weather Awareness was formed in 1991 to coordinate public information efforts regarding tornadoes, lightning, flooding and winter weather. For more information, visit **www.michiganweather.org**.

STATE OF MICHIGAN

Executive Office

Jennifer M. Granholm
Governor

CERTIFICATE OF PROCLAMATION

On behalf of the citizens of Michigan, I, Governor Jennifer M. Granholm hereby proclaim the week of March 26, 2006, as

Severe Weather Awareness Week

Whereas, Severe weather, in the form of thunderstorms, wind storms, floods, and tornadoes, is a threat to the safety and welfare of all Michigan citizens; and,

Whereas, Each year, more than 1,000 tornadoes strike the United States, including an average of sixteen tornadoes in Michigan annually; and,

Whereas, Since 1950, 874 tornadoes have been reported in the State of Michigan, resulting in substantial loss of life and property damage; and,

Whereas, Because of the high concentration of people in our urban areas, Michigan citizens are particularly vulnerable to the devastating effects of tornadoes, flash floods, and other severe weather; and,

Whereas, There were 11 injuries, and nearly $10 million in property damage in 2005 due to severe weather; and,

Whereas, Our citizens should be aware of the early warning signs of severe weather and of proper safety and emergency procedures; and,

Whereas, Each year, the State, the Michigan Committee for Severe Weather Awareness, and other emergency management officials, in conjunction with the news media, cooperate to educate the public about the dangers of tornadoes and other severe weather events and the precautions that can be taken to save lives and protect families; and now therefore be it,

Resolved, That I, Jennifer M. Granholm, Governor of the State of Michigan, do hereby proclaim the week of March 26, 2006, as Severe Weather Awareness Week in Michigan and I encourage all citizens to learn more about protecting themselves, their families, and their homes.

Jennifer M. Granholm
Governor

Michigan Committee for Severe Weather Awareness

The committee was formed in 1991 to coordinate public information efforts regarding flood, tornado and winter safety.

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Michigan Committee for Severe Weather Awareness

4000 Collins Road, P.O. Box 30636, Lansing, MI 48909-8136

Press Release

For Immediate Release
March 3, 2005

For more information contact
Any MCSWA committee member

Gov. Granholm Proclaims March 26 – April 1, 2006 Severe Weather Awareness Week in Michigan

LANSING - Gov. Jennifer M. Granholm has proclaimed March 26 – April 1, 2006, Severe Weather Awareness Week in Michigan. During this week, Michigan residents are encouraged to learn more about the risks associated with severe weather and become familiar with the information necessary to help them protect themselves and their property in the event of severe weather.

"Michigan's geographical location makes it susceptible to a variety of severe weather events, including flooding, tornadoes, blizzards, sustained heat and drought," said Capt. Kriste Etue, Commander of the Michigan State Police Emergency Management and Homeland Security Division. "We urge the people of Michigan to be aware and prepared so as to protect themselves, their families and property."

Occurrences of severe weather in 2005 were well below the average in Michigan. Only five tornadoes developed across the state during the year, well below the average of 16. The numbers of floods and severe thunderstorms were also well below the average. However, even with the lighter year in 2005, there were still injuries and millions of dollars worth of damage. The five tornadoes caused nearly a quarter million dollars worth of damage. Severe thunderstorms were responsible for six injuries and over $4 million in damage. Over $2 million and five injuries resulted from the numerous lightning strikes. While there were no injuries as a result of the floods across the state, there were still over $1 million worth of flood-related damages.

It was a very quiet spring across Michigan with virtually no severe weather until June. June 5 was one of the busiest days on record just for the sheer number of severe weather events. There were 85 distinct severe weather events, including large hail, damaging winds and one tornado, recorded in southern Lower Michigan. Severe weather wasn't just limited to the south, severe thunderstorms also rolled through the northern Lower and Upper Peninsula, including a tornado in Gogebic County.

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July brought more severe weather to the Lower Peninsula as several squall lines moved through the region. On July 18, a line of severe thunderstorms brought damaging winds of 70 to 80 mph to northern Lower Michigan, downing many trees between West Branch and Rose City. Two additional squall lines moved through the Lower Peninsula on July 24 and July 26. Both of these occurred in the morning hours. The squall line on July 26 also produced an F1 tornado in Lake County.

F0 Tornado Newaygo County, June 29, 2005

An organized complex of severe thunderstorms developed ahead of an approaching cold front during the morning hours of August 9. These severe storms moved east across Upper Michigan, producing widespread damaging winds from Watersmeet to Newberry. Numerous trees and power lines were downed, with several buildings in the path of these storms incurring minor structural damage. A wind gust of 89 mph was measured with these storms as they moved through Iron River. The last significant severe thunderstorm event was on Sept. 13. A classic squall line moved across all of Northern Michigan during the evening hours. Winds were estimated at 80 to 90 mph. There was widespread damage to trees and numerous power outages.

The Michigan Committee for Severe Weather Awareness encourages Michigan residents to:

- Become familiar with the various severe weather alerts;
- Have a preparedness kit for home and car, to include a first aid kit, flashlight, portable radio and extra batteries;
- Monitor NOAA Weather Radio and local radio, television and cable stations; and
- Keep an eye on the sky.

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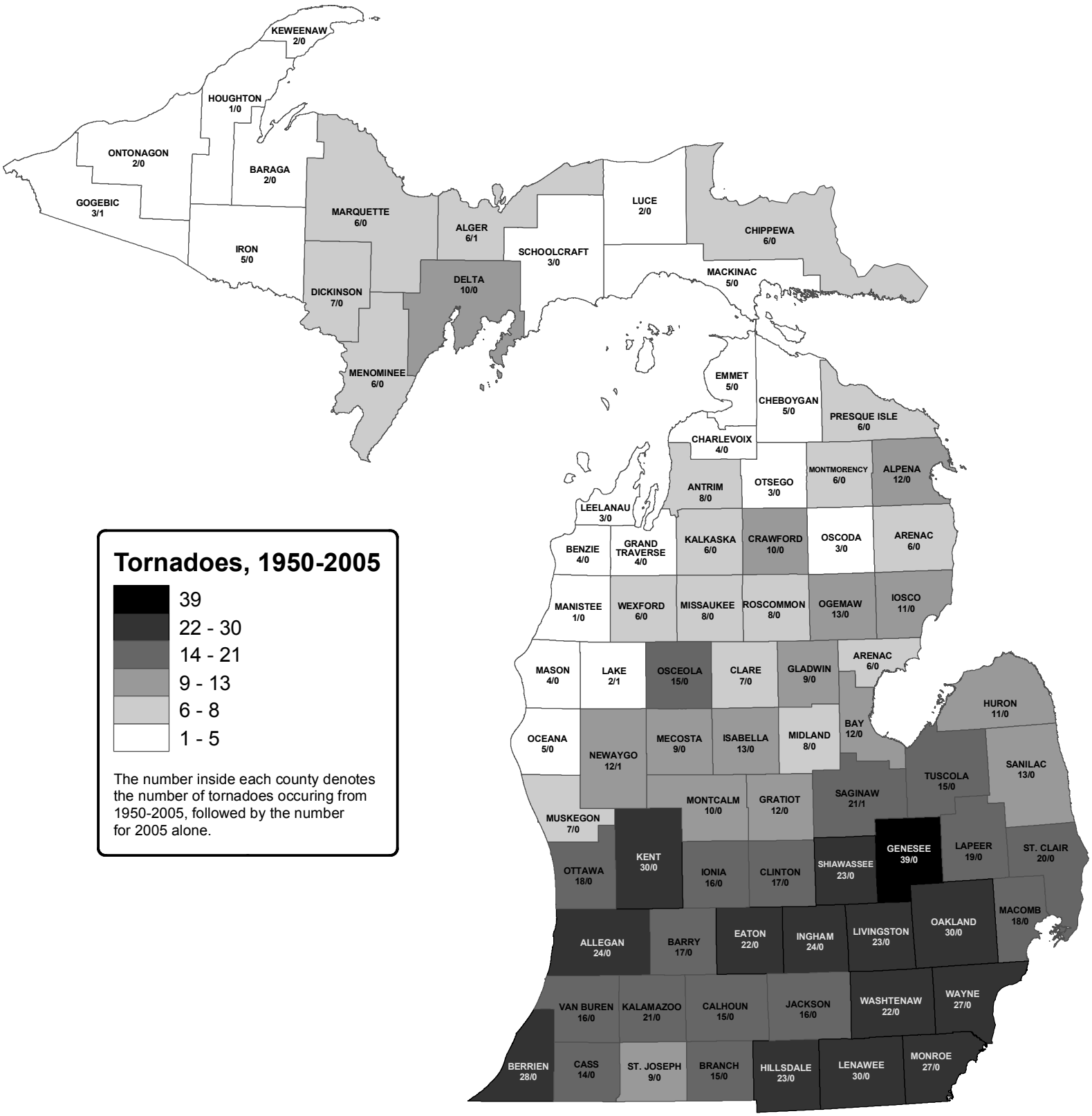
Michigan Tornado Chart

The following is a list of tornadoes experienced by each county in Michigan.

County	1950-2005	2005	County	1950-2005	2005
Alcona	10	0	Lake	2	1
Alger	6	1	Lapeer	19	0
Allegan	24	0	Leelanau	3	0
Alpena	12	0	Lenawee	30	0
Antrim	8	0	Livingston	23	0
Arenac	6	0	Luce	2	0
Baraga	2	0	Mackinac	5	0
Barry	17	0	Macomb	18	0
Bay	12	0	Manistee	1	0
Benzie	4	0	Marquette	6	0
Berrien	28	0	Mason	4	0
Branch	15	0	Mecosta	9	0
Calhoun	15	0	Menominee	6	0
Cass	14	0	Midland	8	0
Charlevoix	4	0	Missaukee	8	0
Cheboygan	5	0	Monroe	27	0
Chippewa	6	0	Montcalm	10	0
Clare	7	0	Montmorency	6	0
Clinton	17	0	Muskegon	7	0
Crawford	10	0	Newaygo	12	1
Delta	10	0	Oakland	30	0
Dickinson	7	0	Oceana	5	0
Eaton	22	0	Ogemaw	13	0
Emmet	5	0	Ontonagon	2	0
Genesee	39	0	Osceola	15	0
Gladwin	9	0	Oscoda	3	0
Gogebic	3	1	Otsego	3	0
Grand Traverse	4	0	Ottawa	18	0
Gratiot	12	0	Presque Isle	6	0
Hillsdale	23	0	Roscommon	8	0
Houghton	1	0	Saginaw	21	1
Huron	11	0	Sanilac	13	0
Ingham	24	0	Schoolcraft	3	0
Ionia	16	0	Shiawassee	23	0
Iosco	11	0	St. Clair	20	0
Iron	5	0	St. Joseph	9	0
Isabella	13	0	Tuscola	15	0
Jackson	16	0	Van Buren	16	0
Kalamazoo	21	0	Washtenaw	22	0
Kalkaska	6	0	Wayne	27	0
Kent	30	0	Wexford	6	0
Keweenaw	2	0			

***A single tornado can cross county lines. Therefore, the sum of the counties will not equal the state totals.**

Current and Historic Tornadoes per County



Tornadoes, 1950-2005

- 39
- 22 - 30
- 14 - 21
- 9 - 13
- 6 - 8
- 1 - 5

The number inside each county denotes the number of tornadoes occuring from 1950-2005, followed by the number for 2005 alone.

Produced by: Michigan State Police Emergency Management Division
February 13, 2006
Data Source: Emergency Management Division

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Tornado/Thunderstorm Safety

Preparing for a tornado / thunderstorm:

- **Plan ahead**. Be sure everyone in your household knows **where to go** and **what to do** in case of a **tornado or thunderstorm warning.**
- Know the **safest location** for shelter in your **home, workplace and school**. Load bearing walls near the center of the basement or lowest level generally provide the greatest protection.
- Know the location of **designated shelter areas** in local **public facilities**, such as schools, shopping centers and other public buildings.
- Have **emergency supplies** on hand, including a battery-operated radio, flashlight and a supply of fresh batteries, first-aid kit, water and cell phone.
- Make an **inventory** of household furnishings and other possessions. Supplement it with photographs of each room. Keep in a safe place.

What to do when a tornado / thunderstorm warning is issued for your area:

- Quickly **move to shelter** in the basement or lowest floor of a permanent structure.
- In **homes and small buildings** go to the basement and get under something sturdy. If no basement is available, go to an interior part of the home on the lowest level. A good rule of thumb is to put as many walls between you and the tornado as possible.
- In **schools, hospitals and public places** move to designated shelter areas. Interior hallways on the lowest floors are generally best.
- **Stay away** from windows, doors and outside walls. Broken glass and wind blown projectiles cause more injuries and deaths than collapsed buildings. Protect your head with a pillow, blanket or mattress.
- **Mobile homes and vehicles** offer virtually no shelter. Leave them and go to the nearest shelter.
- If there is **no shelter nearby**, the **best alternative** is to find a low spot away from trees, fences and poles, but not in a place subject to flooding. Shield your head with your arms.
- If you are **boating or swimming**, get to land and shelter immediately.
- Follow the **30/30 Lightning Safety Rule.** Go indoors if, after seeing lightning, you cannot count to 30 before hearing thunder. Stay indoors for 30 minutes after hearing the last clap of thunder. Lightning often strikes outside of heavy rain and may occur greater than 10 miles from any rainfall.
- If you feel your **skin tingle** or **hair stand on end**, lightning may be about to strike. Squat low to the ground on the balls of your feet. Place your hands on your knees with your head between them. Minimize contact with the ground.
- **Telephone lines** and **metal pipes** can **conduct electricity**. Unplug appliances not necessary for receiving weather information. Use plug-in telephones only in an emergency.

After a tornado / thunderstorm:

- **Inspect** your property and motor vehicles for damage. Write down the date and list damages for insurance purposes. Check for **electrical problems** and **gas leaks** and report them to the utility company at once.
- **Watch out** for **fallen power lines**. Stay out of **damaged buildings** until you are sure they are safe and will not collapse. Secure your property from further damage or theft.
- Use only approved or chlorinated supplies of **drinking water**. Check food supplies.

Anytime:

- **Listen** for **NOAA Weather Radio All Hazards,** or local radio, television and cable stations for the latest weather updates. Make sure your NOAA Weather Radio has a battery back up.
- For NOAA Weather Radio information, including a station near you, see the **NOAA Weather Radio** page on the **Internet** at weather.gov/nwr/. A number of related publications produced by the National Weather Service, American Red Cross and Federal Emergency Management Agency are available on-line at weather.gov/om/brochures.shtml

Tornado Facts

1. What is a tornado?

It is a column of violently rotating winds extending down from a thunderstorm cloud and touching the surface of the earth.

2. What is the difference between a tornado and a funnel cloud?

A funnel cloud is also a column of violently rotating winds extending down from a thunderstorm; however, it does not touch the earth.

3. How many tornadoes usually occur in Michigan every year?

An average of 16 tornadoes occurs in Michigan each year. Since 1950, 239 persons have been killed due to tornadoes. During this same time, Michigan has experienced 874 tornadoes.

4. When do tornadoes generally occur?

Most tornadoes occur during the months of May, June, July and August in the late afternoon and evening hours. However, tornadoes can occur anytime of the day or night in almost any month during the year.

5. How fast do tornadoes travel?

Tornadoes generally travel from the southwest and at an average speed of 30 miles per hour. However, some tornadoes have very erratic paths, with speeds approaching 70 mph.

6. How far do tornadoes travel once they touch the ground?

The average Michigan tornado is on the ground for less than 10 minutes and travels a distance of about 5 miles. However, they do not always follow the norm, and have been known to stay on the ground for more than an hour and travel more than 100 miles.

7. What is a tornado watch?

A tornado/severe thunderstorm watch is issued whenever conditions exist for severe weather to develop. Watches are usually for large areas about two-thirds the size of Lower Michigan and are usually two-to-six hours long. Watches give you time to plan and prepare.

8. What is a tornado warning?

The local Weather Service (NWS) office issues a tornado warning whenever a tornado has been sighted or NWS Doppler Radar indicates a thunderstorm capable of producing a tornado. A severe thunderstorm warning is issued whenever a severe thunderstorm is observed or NWS Doppler Radar indicates a thunderstorm capable of producing damaging winds or large hail. Warnings are for smaller areas, such as counties, and are usually 30 to 90 minutes in length. You must act immediately when you first hear the warning. If severe weather is reported near you, seek shelter immediately. If not, keep a constant lookout for severe weather and stay near a shelter.

9. How do I find out about a warning if my electricity is already out?

NOAA Weather Radio All Hazards with battery back-up capability is your best source to receive the warning. In some areas, civil emergency sirens may be your first official warning. In addition, if your television or radio has battery back-up capability, you may receive NOAA's National Weather Service warnings from local media.

Michigan Committee for Severe Weather Awareness

4000 Collins Road, P.O. Box 30636, Lansing, MI 48909-8136

Press Release

For Immediate Release
March 3, 2005

For more information contact
Any MCSWA committee member

RECORD FLOODING OCCURRED IN MICHIGAN DURING 2005

LANSING - In 2005, 18 Flash Flood Warnings and 33 Flood Warnings were issued by National Weather Service offices across the state of Michigan. Record flooding occurred in Ottawa County's Robinson Township along the Grand River in January of 2005 as the result of ice jams. During that same time period, flooding from ice jams also occurred on the Grand River near Comstock Park, Portland, and Lansing, and on the Kalamazoo River near Allegan, Flat River near Smyrna, and the Muskegon River near Big Rapids. Fortunately these floods, which caused over $2 million in economic and property damage, resulted in no deaths or injuries.

To focus attention on flood safety planning, Gov. Jennifer M. Granholm has declared March 26–April 1, 2006, as Severe Weather Awareness Week in Michigan. Residents are encouraged to familiarize themselves with flood safety procedures.

"Flooding can occur at any time and anywhere in Michigan, but in 2005 the majority of flooding occurred during the winter months due to ice jams. Flooding caused by ice jams can be especially dangerous, as river levels behind the ice jam can rise by several feet per hour," said Mark Walton, Service Hydrologist with the National Oceanic and Atmospheric Administration's National Weather Service in Grand Rapids.

According to the Michigan Committee for Severe Weather Awareness, flooding along Michigan's rivers can occur any time of the year, and is most likely the result of excessive rainfall and/or a combination of rainfall and snowmelt. Ice jams also cause flooding in winter and early spring. Severe thunderstorms may cause flooding during the summer or fall, although these are normally localized, and have more impact on watercourses with smaller drainage areas.

Oftentimes, flooding is not directly attributable to a river, stream or lake overflowing its banks. Rather, it may simply be the combination of excessive rainfall and/or snowmelt, saturated or frozen ground, and inadequate drainage. With no place to go, the water will find the lowest elevations – areas that are often

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not in a floodplain. That type of flooding is becoming increasingly prevalent in Michigan, as development outstrips the ability of the drainage infrastructure to properly carry and disperse the water flow.

The Michigan Department of Environmental Quality estimates that about 6 percent of Michigan's land is flood-prone, including about 200,000 buildings. The southern half of the Lower Peninsula contains the areas with the most flood damage potential.

Residents should be aware that regular homeowners' insurance policies do not cover damages that result from flooding. Coverage is available through a federal program; however, in Michigan only about 15 percent of structures subject to flooding are actually insured against the risk.

Currently, about 777 Michigan communities participate in the National Flood Insurance Program (NFIP), and over 26,000 policies are in force with coverage of nearly $3.5 billion. Under the NFIP, a flood is defined in part as a general and temporary condition of partial or complete inundation of normally dry land areas from overflow of inland or tidal waters, or from the unusual and rapid accumulation of runoff of surface waters from any source.

It is important to note that this flood definition covers general street flooding that enters a home, and not just from a river. In the standard flood insurance policy, direct physical losses by flood are covered. Also covered are losses resulting from erosion caused by waves or currents of water exceeding anticipated cyclical levels or erosion accompanied by a severe storm, flash flood, abnormal tidal surge, or the like. Basement flooding is a covered hazard under the NFIP policy. However, homeowners should be aware that personal property is not covered in a basement location. Losses from water seepage, sewer backup, or hydrostatic pressure are covered only when they occur in conjunction with a general condition of flooding.

To purchase flood insurance under the program, residents must live in one of the participating communities. Coverage can be obtained through most licensed property/casualty insurance agents. If you would like more information about the NFIP, please contact Les Thomas, Michigan Department of Environmental Quality, Land and Water Management Division, P.O. Box 30458, Lansing, MI 48909, by email to thomasl@michigan.gov, or by telephone at 517-335-3448.

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Flood Safety

Preparing for a flood:

- Make an itemized list of personal property well in advance of a flood occurring. Photograph the interior and exterior of your home. Store the list, photos and documents in a safe place.
- Memorize the safest and fastest route to high ground. Assemble a disaster supplies kit containing: first aid kit, canned food and can opener, bottled water, extra clothing, rubber boots and gloves, NOAA Weather Radio, battery-operated radio, emergency cooking equipment, flashlight and extra batteries.
- If you live in a frequently flooded area, keep sandbags, plastic sheets and lumber on hand to protect property. Install check valves in building sewer traps to prevent flood water from backing up into the drains of your home.
- Know the elevation of your property in relation to nearby streams and other waterways, and plan what you will do and where you will go in a flood emergency.

When a flood threatens:

- If forced to leave your property and time permits, move essential items to safe ground, fill tanks to keep them from floating away and grease immovable machinery.
- Store a supply of drinking water in clean bathtubs and in large containers.
- Get out of areas subject to flooding. This includes dips, low spots, floodplains, etc.

During a flood:

- Avoid areas subject to sudden flooding.
- Even six inches of fast moving floodwater can knock you off your feet, and a depth of two feet will float your car! Never try to walk, swim or drive through such swift water.
- Do not attempt to drive over a flooded road. STOP! Turn around and go another way.
- Keep children from playing in floodwaters or near culverts and storm drains.

After a flood:

- Boil drinking water before using. If fresh food has come in contact with floodwaters, throw it out.
- Seek necessary medical care at the nearest hospital. Food, clothing, shelter and first aid are available at Red Cross shelters.
- Use flashlights, not lanterns or torches, to examine buildings. Flammables may be inside.
- Do not handle live electrical equipment in wet areas. Electrical equipment should be checked and dried before being returned to service.

Where can I find additional safety information?

Turn Around, Don't Drown are literally words to live by. This slogan highlights the nationwide flood safety public awareness campaign to help reduce flood-related deaths in the United States. The poster, a Turn Around, Don't Drown sign, window sticker, FLASH card and a NOAA National Weather Service flood safety brochure are also available online at http://www.nws.noaa.gov/os/water/tadd.

Flood Facts

1. What is a flood and when do most occur?

A flood is the inundation of a normally dry area caused by an increased water level in an established watercourse, such as a river, stream, or drainage ditch, or ponding of water at or near the point where the rain fell. Floods can occur anytime during the year. However, many occur seasonally after winter snow melts or heavy spring rains.

2. What are flash floods?

Flash floods occur suddenly, usually within 6 hours of the rain event, and result from heavy localized rainfall or levee failures. Flash floods can begin before the rain stops. Water level on small streams may rise quickly in heavy rainstorms, especially near the headwaters of river basins. Heavy rains can also cause flash flooding in areas where the floodplain has been urbanized.

3. What are other causes of flooding in Michigan?

Ice jams and dam failures can also cause both flooding and flash flooding.

4. Are people killed as a result of floods?

Many people are killed by flash floods when driving or walking on roads and bridges that are covered by water. In fact, flash floods are the number one weather-related killer in the United States. Even six inches of fast-moving flood water can knock you off your feet, and a depth of only two feet of water will float many of today's automobiles. If you are in a car and water starts rising, get out and move to higher ground.

5. What is a flood watch?

A flood watch indicates that flash flooding or flooding is possible within the designated WATCH area -- be alert. It is issued to inform the public and cooperating agencies that current and developing weather conditions are such that there is a threat of flooding, but the occurrence is neither certain nor imminent.

6. What is a flash flood or flood warning?

A flash flood or flood warning indicates that flash flooding or flooding is already occurring or imminent within the designated WARNING area -- take necessary precautions at once. When a flash flood or flood warning is issued for your area, act quickly. Get out of areas subject to flooding and avoid areas where flooding has already occurred.

7. What is a flash flood or flood statement?

A flash flood or flood statement is used for follow-up information regarding a flash flood or flood event.

Flood Protection

Ways to protect your house and property from flooding.

Basement flood protection can involve a variety of changes to your house and property—changes that can vary in complexity and cost. You may be able to make some types of changes yourself. Complicated or large scale changes or those that affect the structure of your house or its electrical wiring and plumbing should be carried out only by a professional contractor licensed to work in your state, county, or city. Below are some examples of flood protection.

- **Install Sewer Backflow Values.** In some flood prone areas, flooding can cause sewage from sanitary sewer lines to back up into houses through drainpipes. Sewage backup not only causes damage, but also creates health hazards. Backflow valves have a variety of designs ranging from simple to complex. This is something that only a licensed plumber or contractor should do.
- **Raise or Flood Proof Heating, Ventilating, and Air Conditioning Equipment**. In flood prone houses, a good way to protect HVAC equipment is to elevate it above the areas that flood. Another method is to leave the equipment where it is and build a concrete or masonry block flood wall around it.
- **Anchor Fuel Tanks.** Unanchored fuel tanks can be easily moved by floodwaters. One way to anchor a tank is to attach it to a large concrete slab whose weight is great enough to resist the force of floodwaters. Elevate tanks to a minimum of at least one foot above the base flood elevation (BFE). Floating and/or damaged tanks pose serious threats not only to you, your family, and your house, but also to public safety and the environment.
- **Raise Electrical System Components.** Any electrical system component, including service panels (fuse and circuit boxes), meters, switches, and outlets, are easily damaged by floodwaters. All components of the electrical system, including the wiring, should be raised at least one foot above the base flood elevation (BFE).
- **Raise Washers and Driers.** Washers and driers can easily be damaged in a flood. In order to prevent this from happening, utilities can be placed on cinder blocks one foot above the base flood elevation (BFE).
- **Add a sump pump in your basement.** Sump pumps can help keep groundwater from entering your home's interior.
- **Cut drywall so that it is one-half to 1-inch off the floor**. This is especially important in basements. Concrete floors commonly absorb ground moisture—especially in winter months. That moisture can wick up the wallboard if it's touching the floor, allowing mold to grow out-of-sight within the walls. (You can hide the gap with wood or rubberized floor trim.)
- **Don't forget to buy flood insurance.** Flood insurance provides year-round financial protection and improves your ability to quickly recover when severe storms strike and cause unexpected flooding. Call your local insurance agent or 1-800-720-1090 to reach National Flood Insurance Program specialists.

Flood Insurance

1. Is flood damage covered by my homeowners insurance?

Flood damage is excluded in nearly all homeowners and renters insurance policies but, if desired, can be purchased as a separate policy.

2. Where do I get flood insurance?

Any licensed property/casualty insurance agent can sell a flood insurance policy. If you experience trouble in locating an agent, contact the National Flood Insurance Progam's (NFIP) agent referral program at 1-888-CALL FLOOD.

3. Is there a waiting period before my flood insurance policy becomes effective?

There is a 30-day waiting period before a new or modified flood insurance policy becomes effective.

4. Are all flood insurance policies the same?

Flood insurance coverage can be purchased for homes and businesses – separate coverage must be purchased for the building and its contents.

5. Do I need to live in a floodplain to get flood insurance?

You do not need to live in a floodplain to purchase flood insurance – coverage is available to any building located in a community that has qualified for the National Flood Insurance Program. For a listing of Michigan communities participating in the NFIP, you may visit http://www.fema.gov/fema/csb.shtm.

6. Is water back up in basements covered by a flood insurance policy?

Coverage for water back up in basements (drains/sewers) is excluded from the flood insurance policy.

7. Can I get coverage for water back up in basements?

Although basement water back up is excluded under most homeowners' insurance policies, coverage can be obtained by purchasing an endorsement. Most insurance companies offer sewer and drain back up as optional coverage. Coverage and limits vary by insurance company, so check with your agent/company about specifics. Some insurers include full coverage for sump pump failure while others specify items that are covered.

8. Are there steps I can take to minimize losses from water back up in basements?

- Never store perishables or valuables in basements that you can't afford to lose or replace.
- Do not store any item near basement drains.
- Check storm drain lines to make sure they're clear of debris, roots, etc.
- Grade the property around your home to drain water away from it.
- Install gutters and make sure downspouts are extended away from the foundation in order to carry water away from the basement walls.
- Use shelving or store items several inches above the potential water level in order to prevent loss.
- If you do have some water seepage following storms, take corrective measures to alleviate problems in the future.

NOAA's National Weather Service Contacts

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How an All Hazards NOAA Weather Radio Warning is Disseminated

1. Your local National Weather Service (NWS) Office uses available data sources such as Doppler Radar, Satellite Imagery, Surface Reports, and Spotter Reports to monitor hazardous weather threats.

2. If the threat of a tornado, severe thunderstorm, or flash flood is sufficiently high, then a warning is issued.

3. Forecasters generate a "hardcopy" of the warning using computer software. Menu-driven software allows the meteorologists to quickly select the type of warning needed, the valid time of the warning, and the counties that must be warned. Information such as affected areas or communities, timing of severe weather, and a safety message is included in this warning.

4. The warning is then broadcast live on the NOAA Weather Radio All Hazards (NWR). If the warning is within the "official" NWR broadcast range (about 40 miles), a 1050 Hertz alarm tone precedes the warning. This 1050 Hertz alarm tone automatically activates NWR receivers equipped with the alert feature. The alarm tone lasts about 9 seconds, and allows people to deactivate their alarm and listen to the warning broadcast.

The NWR is also able to integrate into the Emergency Alert System (EAS), using the Specific Area Message Encoder (SAME). The EAS is activated for life-threatening weather events in specific areas, and incorporates all radio, TV, and cable stations. The weather threat is quickly disseminated on these commercial TV and radio stations, reaching a wide audience in the affected area(s).

5. The "hardcopy" of the warning is simultaneously sent, via satellite uplink, to a wide variety of customers, including the NOAA Weather Wire Service, Internet, and to major news wire services, such as the AP. These services distribute the warning to their customers, which include many local TV and radio stations. The local radio and TV stations then disseminate the warning to their listening and viewing audience.

6. Emergency Managers enact their local severe weather plans, such as activating local dissemination systems, positioning storm spotters, or activating outdoor sirens, as needed.

7. Updated information on the storm position and spotter reports is provided in follow-up severe weather statements and broadcast on the NWR as it becomes available.

Listen to NOAA Weather Radio All Hazards for the most timely and complete warning services!

NOAA Weather Radio All Hazards broadcasts warning and post-event information for all types of hazards - both natural and technological. Working with other Federal agencies and the Federal Communications Commission's Emergency Alert System, NOAA Weather Radio is an "***all hazards***" radio, network making it the single source for the most comprehensive weather and emergency information available to the public.

Michigan NOAA Weather Radio Coverage